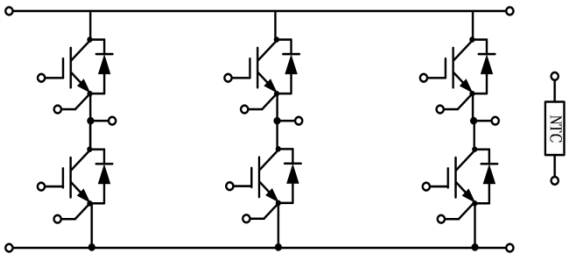
EconoPIM3 SixPack IGBT Module

V_{CES}=1700V, I_C=75A, $V_{CE(sat)}$=1.9V

Features

- Low collector to emitter saturation voltage
- Switching-Loss rating includes all “tail” losses
- Optimized for Fast Switching
- Short circuit withstands time (10us min.)
- Vcesat with positive Temperature Coefficient



Applications

- Static var generator
- Inverter for motor drive
- High Power Converters

IGBT, Inverter

Maximum Ratings

Parameter	Symbol	Condition	Value	Unit
Collector-emitter voltage	V_{CES}	T_{vj}=25℃, V_{GE}=0V	1700	V
Continuous DC collector current	$I_{C\ nom}$	T_C=100℃	75	A
Repetitive peak collector current	I_{CRM}	t_P=1ms	150	A
Gate-emitter peak voltage	V_{GES}	T_{vj}=25℃	±20	V
Maximum Power Dissipation (IGBT)	P_D	T_C=25℃, T_J=175℃	555	W
Short Circuit Withstand Time	t_{sc}	V_{CC}=900V, V_{GE}≤15V	10	us

Characteristics Values

Parameter	Symbol	Conditions		Value			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=75A, V_{GE}=15V	T_{vj}=25℃		1.9		V
			T_{vj}=125℃		2.16		
			T_{vj}=150℃		2.26		
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C=1mA, V_{CE}=V_{GE}	T_{vj}=25℃	5.0	6.0	7.0	V
Input capacitance	C_{ies}	V_{CE}=25V, V_{GE}=0V, f=1MHz	T_{vj}=25℃		7.5		nF
Reverse transfer capacitance	C_{res}		T_{vj}=25℃		0.22		nF
Collector-emitter cut-off current	I_{CES}	V_{CE}=V_{CES}, V_{GE}=0V	T_{vj}=25℃			1.0	mA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V	T_{vj}=25℃			100	nA

Internal Gate Resistance	R_g		T_{vj}=25℃		8.1		Ω
Turn-on delay time	$t_{d\ on}$	V_{CC}=900V, I_C=75A, V_{GE}=±15V, L=525uH, Rg=5.6Ω	T_{vj}=25℃		155		ns
			T_{vj}=125℃		175		
			T_{vj}=150℃		175		
Rise time	t_r		T_{vj}=25℃		61		
			T_{vj}=125℃		64		
			T_{vj}=150℃		64		
Turn-off delay time	$t_{d\ off}$		T_{vj}=25℃		265		
			T_{vj}=125℃		290		
			T_{vj}=150℃		306		
Fall time	t_f		T_{vj}=25℃		568		
			T_{vj}=125℃		822		
			T_{vj}=150℃		881		
Turn-on energy loss per pulse	E_{on}		T_{vj}=25℃		18.2		mJ
			T_{vj}=125℃		22.8		
			T_{vj}=150℃		24.8		
Turn-off energy loss per pulse	E_{off}		T_{vj}=25℃		14.8		
			T_{vj}=125℃		20.9		
			T_{vj}=150℃		22.9		

Diode, Inverter

Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	T_{vj}=25℃	1700	V
Continuous forward current	I_F	T_C=100℃	75	A
Repetitive peak forward current	I_{FRM}	t_P= 1ms	150	A

Characteristics Values

Parameter	Symbol	Conditions		Value			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F=75A, V_{GE}=0V	T_{vj}=25℃		1.6		V
			T_{vj}=125℃		1.7		
			T_{vj}=150℃		1.7		
Peak reverse recovery current	I_{RM}	I_F=75A, V_{CC}=900V, V_{GE}=-15V, L=525uH, Rg=5.6Ω	T_{vj}=25℃		131		A
			T_{vj}=125℃		137		
			T_{vj}=150℃		143		
Recovered charge	Q_{rr}		T_{vj}=25℃		21.0		μC
			T_{vj}=125℃		30.6		
			T_{vj}=150℃		34.6		
Reverse recovery energy	E_{rec}		T_{vj}=25℃		13.3		mJ
			T_{vj}=125℃		19.8		
			T_{vj}=150℃		22.4		

NTC Thermistor

Characteristic values

Symbol	Condition	Typ.	Max.	Unit
R_{25}	T_C=25℃	5		kΩ
△R/R	T_C=100℃ , R_{100}=481Ω		±5	%
P_{25}	T_C=25℃	50		mW
$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T2-1/(298.15K))]$	3380		K
$B_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T2-1/(298.15K))]$	3440		K

Module

Characteristics Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=1min		4		kV
Maximum Junction Temperature	T_J				175	℃
Maximum Operating Junction Temperature Range	T_{JOP}		-40		+150	℃
Storage temperature	T_{stg}		-40		+150	℃
Junction-to-Case (per IGBT) Junction-to-Case (per Diode)	R_{thJC}			0.27 0.47		K/W
Case-to-Heatsink (per IGBT) Case-to-Heatsink (per Diode) Case-to-Heatsink (per Module)	R_{thCH}			0.11 0.18 0.01		K/W
Mounting torque for module mounting	M		3	-	6	N·m
Weight	G			300		g

Typical Characteristics

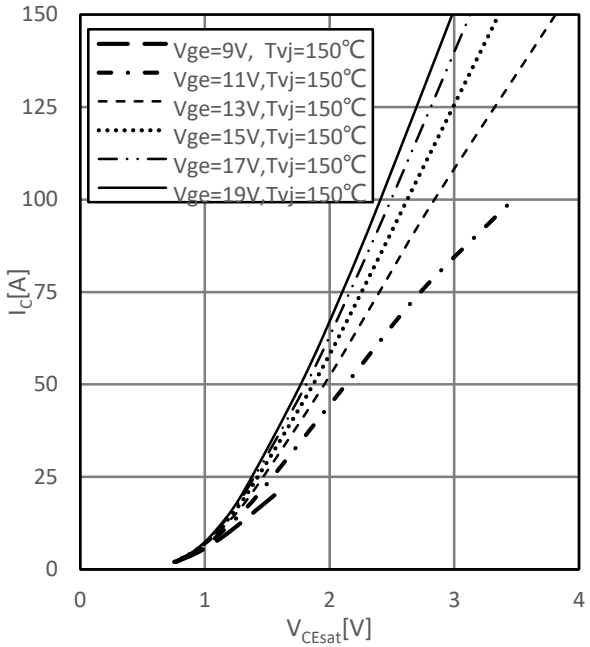


Fig.1 output characteristic IGBT Inverter (typical)

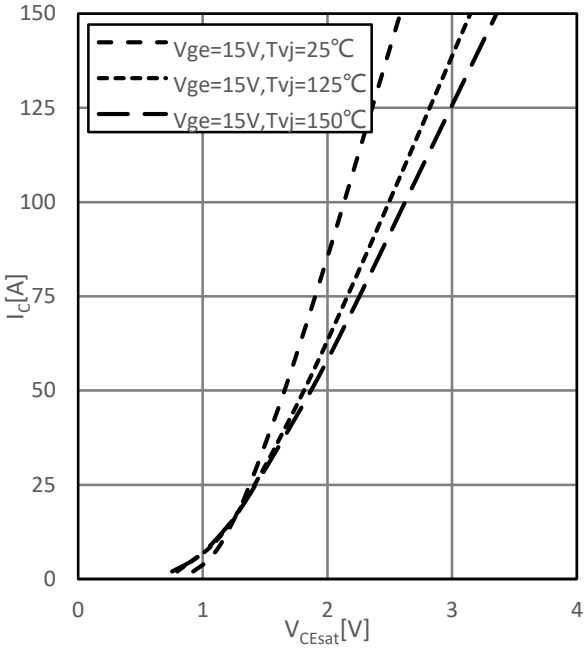


Fig.2 output characteristic IGBT Inverter (typical)

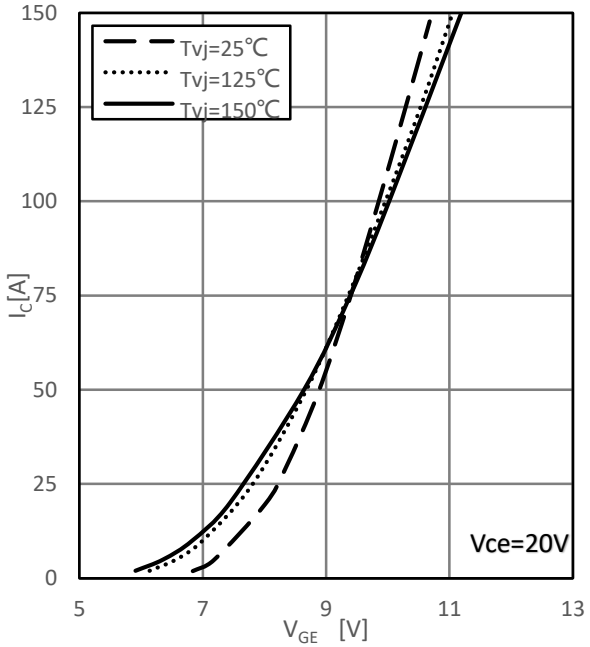


Fig.3 transfer characteristic IGBT Inverter (typical)

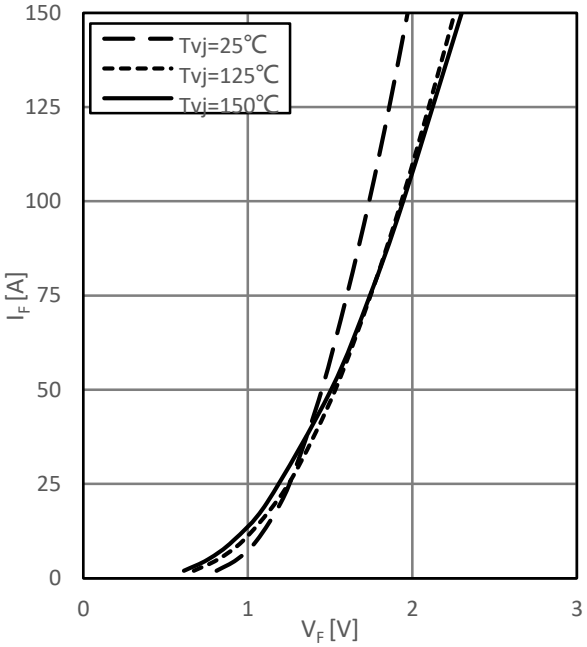


Fig.4 forward characteristic of Diode, Inverter (typical)

V_{CC}=900V，V_{CE}=±15V
R_G=5.6Ω

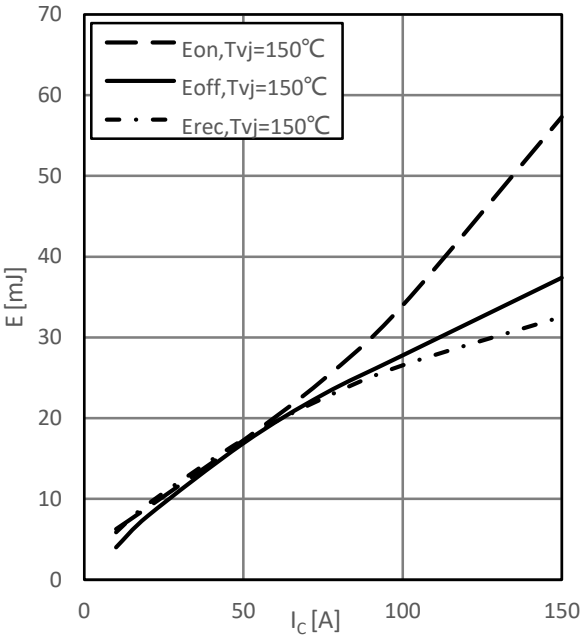


Fig.5 switching losses IGBT Inverter (typical)

V_{CC}=900V，V_{CE}=±15V
Ic=75A

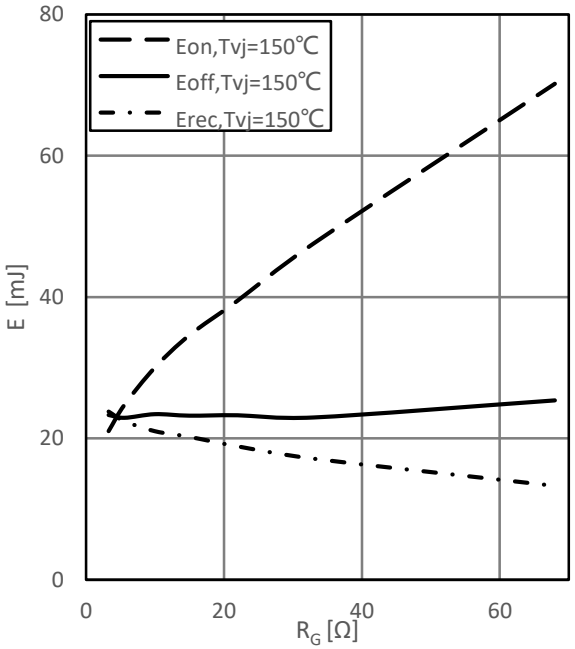


Fig.6 switching Losses vs. Gate Resistance (Typical)

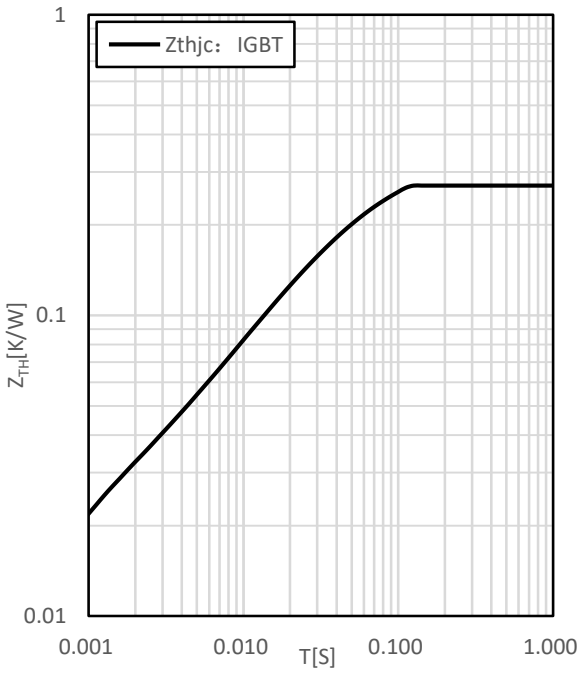


Fig.7 Transient thermal impedance IGBT

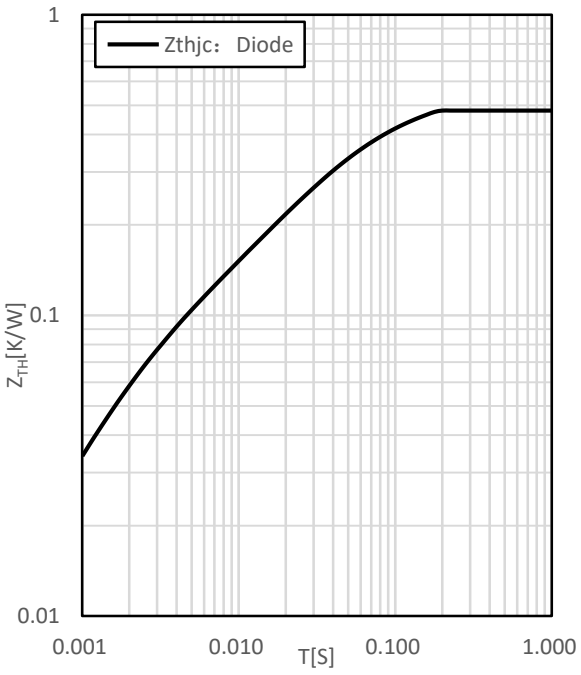


Fig.8 Transient thermal impedance Diode

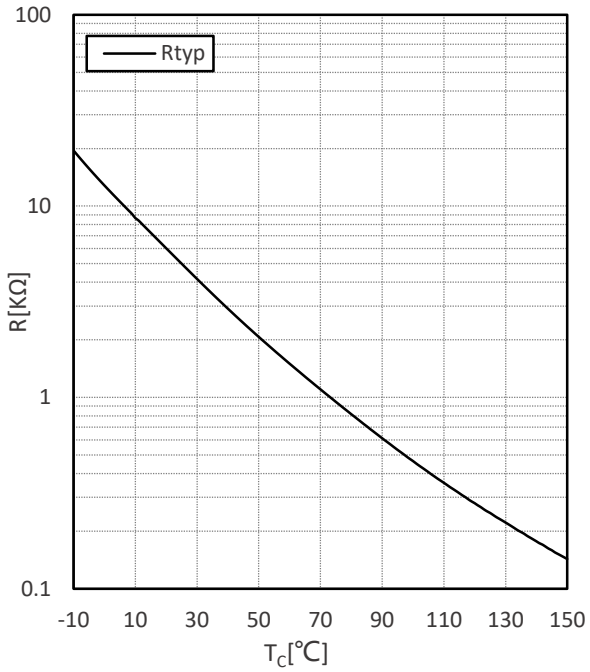
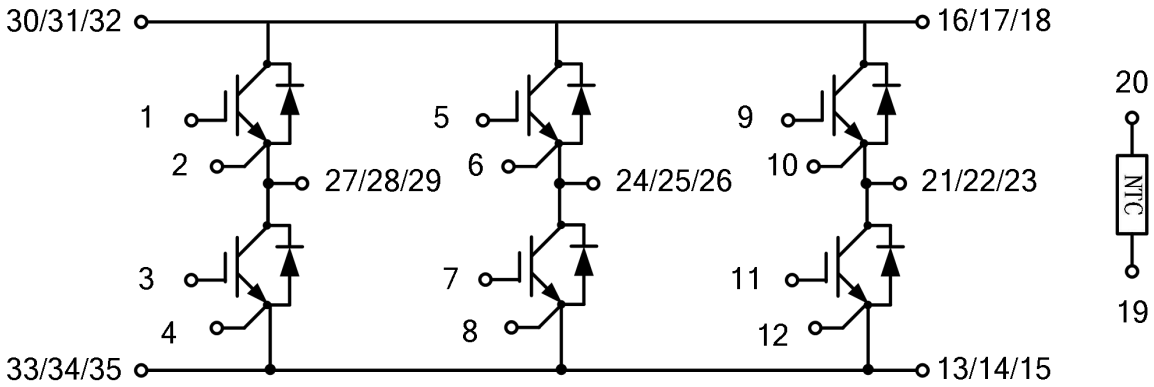
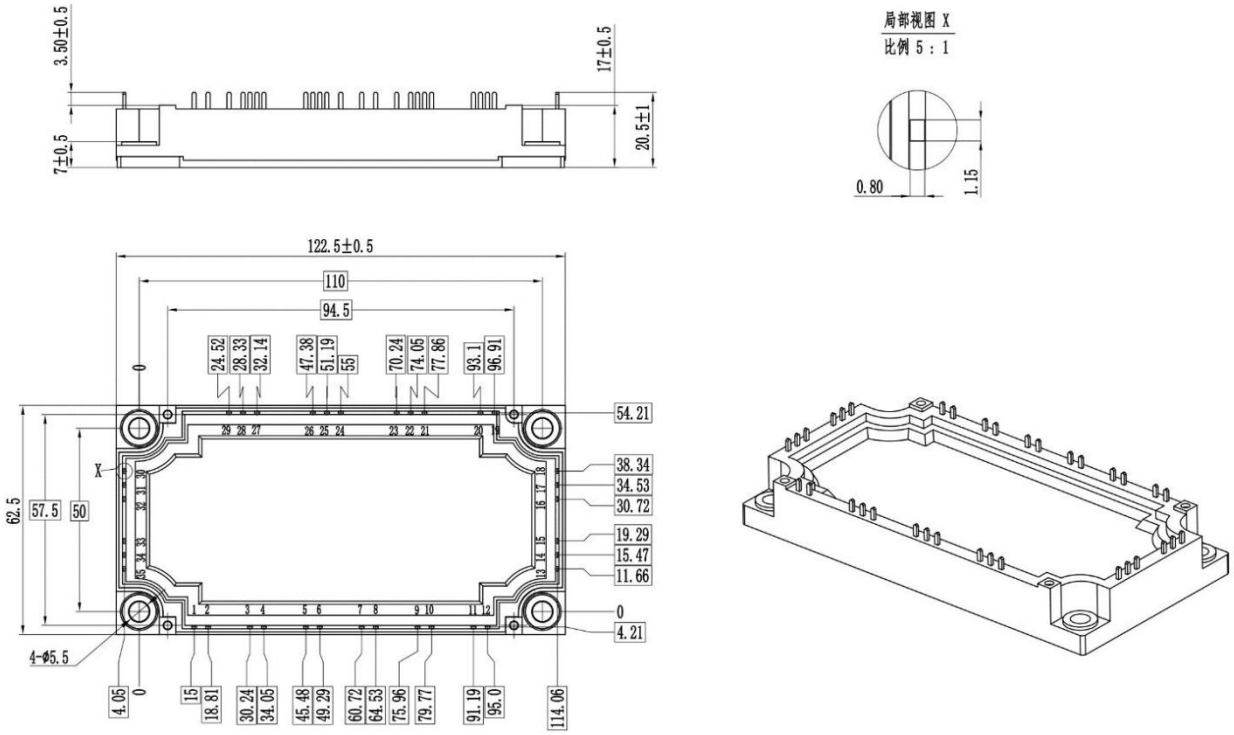


Fig.9 NTC Temperature characteristics

Circuit Diagram



Package Outlines (Unit:mm)



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